



Gladman, John R.F. and Conroy, Simon P. and Ranhoff, Anette H. and Gordon, Adam L. (2016) New horizons in the implementation and research of comprehensive geriatric assessment: knowing, doing and the “know-do” gap. *Age and Ageing* . ISSN 0002-0729 (In Press)

Access from the University of Nottingham repository:

<http://eprints.nottingham.ac.uk/31871/1/Know%20do%20gap%20article%20for%20e-repository.pdf>

Copyright and reuse:

The Nottingham ePrints service makes this work by researchers of the University of Nottingham available open access under the following conditions.

- Copyright and all moral rights to the version of the paper presented here belong to the individual author(s) and/or other copyright owners.
- To the extent reasonable and practicable the material made available in Nottingham ePrints has been checked for eligibility before being made available.
- Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.
- Quotations or similar reproductions must be sufficiently acknowledged.

Please see our full end user licence at:

http://eprints.nottingham.ac.uk/end_user_agreement.pdf

A note on versions:

The version presented here may differ from the published version or from the version of record. If you wish to cite this item you are advised to consult the publisher’s version. Please see the repository url above for details on accessing the published version and note that access may require a subscription.

For more information, please contact eprints@nottingham.ac.uk

New Horizons in the Implementation and Research of Comprehensive Geriatric Assessment: knowing, doing and the “know-do” gap

Prof John RF Gladman
Division of Rehabilitation and Ageing
Medical School, Queen's Medical Centre
Nottingham, NG7 2UH
UK

Prof Simon P Conroy
University of Leicester School of Medicine
Windsor Building, Leicester Royal Infirmary,
Leicester, LE1 5WW
UK

Anette H Ranhoff,
Kavli Research Centre for Ageing and Dementia,
Bergen,
Norway.

Adam L Gordon (corresponding author)
Division of Medical Sciences and Graduate Entry Medicine
University of Nottingham
Royal Derby Hospital, Uttoxeter Road,
Derby. DE22 3NE.
UK
adam.gordon@nottingham.ac.uk

**This article was accepted for publication in *Age and Ageing* on 11th Jan 2016.
This represents a final pre-publication draft.**

Keypoints:

- CGA has an evidence base that merits its implementation for older people with frailty both in hospital and other settings.
- The evidence base for how CGA can be implemented and its effectiveness in modern and novel settings also needs to be developed,
- Applied health research and service innovation and development need to take place in parallel, This requires health researchers and those who might apply research knowledge to work together to develop a better evidence base

Abstract

In this paper we outline the relationship between the need to put existing applied health research knowledge into practice (the “know-do gap”) and the need to improve the evidence base (the “know gap”) with respect to the health care process used for older people with frailty known as comprehensive geriatric assessment (CGA).

We explore the reasons for the know-do gap and the principles of how these barriers to implementation might be overcome. We explore how these principles should affect the conduct of applied health research to close the know gap.

We propose that impaired flow of knowledge is an important contributory factor in the failure to implement evidence-based practice in comprehensive geriatric assessment; this could be addressed through specific knowledge mobilisation techniques. We describe that implementation failures are also produced by an inadequate evidence base which requires the co-production of research, addressing not only effectiveness but also the feasibility and acceptability of new services, the educational needs of practitioners, the organisational requirements of services, and the contribution made by policy. Only by tackling these issues in concert and appropriate proportion, will the know and know-do gaps for CGA be closed.

Keywords: Geriatric assessment, Translational Medical Research, Homes for the Aged, Organizational Models, Health Services Research, Older people.

Introduction

Comprehensive geriatric assessment (CGA) is a multidimensional, interdisciplinary diagnostic process to determine the medical, psychological, and functional capabilities of an older person with frailty, followed by implementation of a coordinated and integrated plan for treatment and follow-up. CGA, when applied in acute hospital wards, was established to be superior to general medical care as a model of caring for older people in a large meta-analysis published in 1993[1]. Further meta-analyses and Cochrane reviews have supported this finding[2]. CGA differs from general medical care in that the latter focuses on making diagnoses and then managing these medically. In general medical care, nurses provide care whilst diagnosis and medical management is taking place. Allied health professionals, although often present on general medical wards, do not frequently interact or become involved in the medical diagnostic process. Thus, although professionals from multiple disciplines are attached to general medical care, they frequently fail to interact as effective multidisciplinary teams. The physicians that lead general medical care frequently do not have specialist training in geriatric medicine. The differences between CGA and general medical care therefore include the presence of additional specialist knowledge about the problems of older people, the systematic application of a “comprehensive” assessment which extends beyond a narrow focus on medical diagnosis and management, and the effective interaction of staff from multiple disciplines so that assessments and decisions are made as a team[3]. The principles of CGA are embedded in trials of stroke rehabilitation units, where a multidisciplinary team of staff with specific skills in a common geriatric syndrome conduct a comprehensive rehabilitation assessment and then work in a co-ordinated fashion to implement the care process and plan follow-up. Trials of these units show similar benefits to the trials of inpatient CGA[4], thus indicating that the benefits that come from the application of the broad principles of CGA extend beyond inpatient wards for geriatric medicine to other specialist contexts.

The service structure of hospital care has changed considerably over the two decades since the first unequivocal meta-analysis showing the benefits of CGA[5]. Much more urgent care of older people takes place in short term settings, such as emergency departments and medical assessment units, with lengths of stay measured in hours or a few days. It is possible that older patients will continue to benefit from CGA in these urgent care settings[6]. The fact that CGA is not universally delivered within such contexts can be described as a failure to implement research knowledge, a “know-do gap”. This may be driven in part by uncertainty about how to adapt and partition CGA so that it can be implemented in such settings: a “know gap”.

The residents of care homes have complex medical problems and extreme frailty[7]. Thus a similar argument can be made, although the evidence base for CGA largely derives from a hospital inpatient setting, that these people should receive services delivering the principles of CGA. They do not, however, do so on a regular basis[8]. This may be because their physicians lack the specific knowledge to lead CGA, and there may not be teams to conduct and enact comprehensive assessments [9]. At the same time, there is also a need to establish how CGA can best be delivered in longer-term care settings, taking account of complex institutional and organisational barriers to implementation[10]. Measures of clinical effectiveness in this setting will always be a composite of the effectiveness of the intervention itself and the mechanisms by which it has been implemented.

The above arguments about needing to close the know-do gap while also closing the know gap can be applied beyond urgent care of older people and the residents of care homes, to groups of older people in different settings, such as older people being treated for cancer[11], or older people undergoing planned or emergency surgery[12].

For each of these instances it could be argued that the venue of care, and patient cohorts, are sufficiently different to justify a full randomized controlled trial (RCT) of CGA in order to show that it improves patient outcomes and is cost-effective in each setting. To an extent, this argument is both logical and defensible but the translation of research findings into real-world practice demands, at some level, that generalisations be made. The balance is between making rash generalisations that do not bear up to scrutiny and *reductio ad absurdum* empiricism where no intervention in any setting might ever be undertaken until all modifiable variables mirror those seen in the RCT literature. RCTs are both time-consuming and resource-intensive. Nuanced collaborative thinking by skilled researchers and clinicians is therefore required on a case-by-case basis to justify what the know and know-do gaps actually are and how they may best be closed.

This article considers why there is a know-do gap, how it can be overcome, and how researchers and practitioners can work together to overcome both the know-do and know gaps.

Barriers to implementation of CGA

Know-do gaps are not unique to CGA and are noted across many domains of health care[13]. The recognition of the existence and importance of know-do gaps has led to scientific enquiry into why they occur and how they might be overcome. This “implementation science” is relatively new, and there is as yet no single unifying theory with widespread consensus to understand implementation. Implementation failure, to some extent, will be a consequence of the limitations in the evidence base itself: evidence to support widespread implementation requires not just showing that an intervention such as CGA ‘can work’ in the ideal circumstances of a randomized controlled trial, but that it ‘does work’ in the real world of routine care and ordinary unselected patients. But even the most robust and best possible pragmatic evidence may fail to be put into practice. A systematic review of twelve published models of implementation success or failure in 2013 identified seven common domains: guideline factors; professional factors; patient factors; professional interactions; incentive and resources; capacity for organisational change; and social, political and legal factors[14]. In this article we use these headings to organise our suggestions about how the CGA evidence base can be generated and put into practice in new or traditional settings.

Guideline factors

The power of guidelines depends, in part, upon the magnitude and robustness of the evidence upon which they are based [15]. But CGA is a complex intervention, which means that it is highly dependent upon the context in which it is put into practice. Care processes required to implement CGA in one setting may not apply in another. For example, the nature of a comprehensive assessment for a person presenting as an emergency to hospital will be different in emphasis and depth from that required by a stable care home resident. A weekly multidisciplinary meeting to plan patient care is

unlikely to be helpful in an emergency department or medical assessment unit, where the lengths of stay are less than 4 or 72 hours respectively, but could be beneficial in a longer stay setting such as a care home. CGA is therefore difficult to implement because guidelines do not always translate well between trial and real world settings and between different clinical settings. Potential pitfalls include the establishment of guidelines which are generalisable but vague, or the misapplication of highly specific guidelines in a context for which they were not developed. It follows that when developing services for older people in new settings, it is necessary to define explicitly what a comprehensive assessment means in that setting (who will do it, what domains will be covered and in what depth). It is also necessary to define how the members of the team (for example nurse, pharmacist, physiotherapist) will combine and co-ordinate their assessments into a single care plan and who will case manage its delivery. The British Geriatrics Society (in the Silver Book[16]) and the Royal College of Physicians of London (in its Acute Care Toolkits[17]) have gone a long way towards doing this for urgent hospital care settings. Although the British Geriatrics Society has started to address the issue of how care in care homes should be structured with its Commissioning Guidance for Care Homes[18], further detail is required about the sustainable implementation of these in long term care.

Professional factors

Having good guidelines is not enough if the staff delivering care do not know about them[19]. It is the authors' experience that CGA remains poorly understood even by those whose main responsibility lies in the care of older people, let alone professionals with general or other specialist roles. In urgent care for example, staff in emergency departments and acute medical assessment units comprise a range of hospital physicians, nurses, physiotherapists, occupational therapists and social workers, where their expertise is based upon the acuity of the condition and is not focussed on holistic care of older people[20, 21]. For many of these staff, the term CGA is unfamiliar, and for others it is understood only to refer to an assessment process rather than the subsequent management process including care planning and case management. There remains a need for a widespread and common understanding of the nature of CGA and its evidence base, which requires a concerted educational effort across undergraduate and post graduate education, across all health and social care disciplines, and at every level of seniority.

Patient factors

The implementation of research knowledge can be impeded if perceptions are not properly considered. With respect to the care of older people, there is a tendency for many older people to be reluctant to use a service for them, such as older patients who declare that they are not going to accept moving to a ward for older people. There is evidence that such attitudes are underpinned by the negative connotations of being old, and an assumption that a service for older people will necessarily be second rate[22]. Yet if they were better informed, the public might clamour for CGA and realise that a focus on older people discriminates in favour of them, not against them. This implies that it is necessary to mobilise patient groups, perhaps in the way that those who invoke the public to support interventions such as new cancer drugs, alongside wider public education about effective models of care, and resolution of how to discuss the care of older people without fear of stigmatisation. This is likely to be rendered more challenging by the fact that a new drug is conceptually much more straightforward than a complex intervention like CGA.

It is not just about perceptions. Services have to be truly fit for those who are expected to use them. Older people and those who represent them should be intimately involved in the setting up and oversight of services, to ensure that they are acceptable to the users. For example, the implementation of CGA in urgent care or care home settings should explicitly address the concerns of patients: they do not want a service for older people to be an underfunded second rate service, and they do not want a system that is so restrictive and inflexible that it denies them the choice and ability to exercise autonomy [23].

Professional interactions

CGA is inherently a multi-professional process and so professional interactions are integral to the success or failure of its implementation[3]. The clinical process of comprehensive assessment and intervention is usually interdisciplinary and so inevitably involves teamwork. Team working in ward-based CGA is well rehearsed: usually a medical specialist with specific training in the medicine of older people leads a defined team of other doctors, nurses, allied health professionals and social care workers to care for a defined cohort of patients, in a defined setting, for a defined period of time. Mobile consultation teams have also been employed, but the evidence for their effectiveness is much weaker[2]. This has been attributed to attenuated team working through lack of co-location and poor implementation of intended actions. It follows that a major challenge of implementing CGA in new settings is to develop an effective means of delivering team based care. Team working to deliver CGA in urgent care settings, care homes or other new settings is not as simple as in a specialist ward for older people[24]. In these settings, other aspects of care may be taking place and staff members may have responsibilities for groups other than older people. This is a justification for the development of acute frailty units within urgent care settings[25], for new team models in care homes, for specific pre- and post-operative teams for older people undergoing surgery and for specific oncogeriatric services for older people being treated for cancer. A challenge in such new systems is to delineate which individual team member will perform a co-ordinating role, and how the diverse inputs required in the conduct of CGA will be drawn together.

Incentives, resources

Evidence to support widespread implementation requires that the gains of an intervention such as CGA are worth the costs of intervention: costing and health economics studies are required, not just effectiveness studies. The implementation of CGA requires a number of professionals to be in post. When a service is first implemented this may involve new staff or staff who have been redeployed. This will require new or different funding, and organisational change. Thus, not only is a sound global economic case needed, the processes to incentivise and mobilise resources in a health care system need to be in place and used correctly. In England, the NHS has commissioners of health care who make contracts with providers of health care. In the case of CGA, the commissioners need to be fully appraised of the benefits in terms of outcomes and quality, the costs, and the feasibility of delivering CGA. Commissioners in the NHS make their commissioning decisions in part by following central guidance, such as guidelines emanating from the National Institute of Health and Social Care Excellence (NICE). It is of note that, at the time of writing that NICE guidelines on CGA have not been published, although guidance on acute care of older people (including the role of CGA) are in development.

Capacity for organisational change

Re-organisation around the principles of CGA is a challenge to care delivery systems that are structured around the single problem-oriented, medical diagnostic model [26]. Most health care coding systems do not facilitate simple and accurate coding of complexity or frailty, that is increasingly being used to target those assumed to be most likely to benefit from CGA [27] – making it unlikely that attempts to change services to meet the need of those with frailty will even be considered, let alone enacted. Payment schemes may not adequately reward systematic approaches to dealing with complexity[28]. It may be important for one sector of the health and social care economy to make an investment (for example for the social care sector to invest in home care) to enable savings to be realised in another (such as through a reduction in people presenting to urgent hospital care)[5]. Without organisational direction, health care professional training may not generate enough professionals with interest, skills and attitudes suitable for the care of older people.

Social, political and legal factors

Fortunately, policy makers have increasingly become aware of the challenge to health and social care systems posed by older people, not least because of the cost implications. In the UK, the plans put forward for the NHS in 2014 in the “Five Year Forward View”[29] proposed a number of new models of health and social care organisation, focussing on increased integrated working, between primary and secondary care, between health and social care and between physical and mental health care. These integrated new models offer the opportunity for organisational change that could better enable delivery of CGA, through breaking down the barriers that stifle the emergence of the integrated CGA process.

Overcoming barriers to implementation

Just as there is no simple consensus about the classification of the barriers to implementation, there is no consensus over how these barriers should be overcome. We propose:

- that implementation failures can be conceptualised in terms of a failure of knowledge flow, and overcome by knowledge mobilisation techniques and increased research awareness across communities of practice including patients and the public, practitioners, educators, providers, commissioners and policy makers
- that implementation failures are also produced by an inadequate evidence base which requires the co-production of research, addressing not only effectiveness but also the feasibility and acceptability of new services, the educational needs of practitioners, the organisational requirements of services, and the contribution made by policy

Co-production of research, communities of practice and knowledge brokers

Involving potential users of the research findings in the research process is one possible mechanism by which the likelihood and speed of the uptake of the findings of the research might be increased. For example, an evaluation of a care home variant of CGA is likely to be more easily taken up in primary care and care homes if general practitioners, existing community services and care home managers took a major role in planning and delivering the intervention[30]. Co-involvement in research by commissioners will necessitate the design of research that answers the questions that

they need answering to be able to implement the findings, such as the costs or workforce implications. Given the relationship between research and development, it is likely that the users of research knowledge (general practitioners, their teams and care home staff) will have considerable experience to impart and may have already tested a variety of interventions from which the researchers could learn. This is an example of non-linear, multidirectional and iterative processes of knowledge exchange, which contrast with traditional models of researchers establishing the evidence-base to drive clinical practice.

There are many other reasons to engage with stakeholders, including patients and the public, in applied clinical research, such as assisting with framing the research question to align with policy, organisational or clinical needs, study recruitment, and the subsequent interpretation and dissemination of the findings.

Co-production of applied health research with stakeholders goes hand-in-hand with service innovation, development and quality improvement. Ecologically valid applied health services research is likely to be more possible if developed through clinical innovation, and refined through clinical quality improvement processes.

The co-production of research and of research outputs requires researchers and potential users of research to be in close contact. Communication needs to be multi-directional because researchers need to attend to users' needs and users need to rapidly and correctly understand the findings of research. Rather than rely on ad hoc links, dependent upon the personalities, histories, geographies and social lives of researchers and other stakeholders, it makes sense to spend effort specifically to build and support networks of such people with the specific aim of supporting the knowledge translation process and closing the know-do gap.

The term “community of interest” refers to such networks[31]. Communities of interest require specific resources to develop and sustain - administration, events, newsletters, websites, webinars and so on. An example from the arena of acute medical care of older patients comes from the close association of the Acute Frailty Network, established under the auspices of NHS Elect as a quality improvement collaborative, and the Hospital Wide-CGA programme, funded by the NHS National Institute of Health Research. By sharing key personnel, regularly meeting to exchange ideas and contributing to each others' publications and outputs, these programmes ensure coherent development of research, development and quality improvement programmes along lines that meet the needs of each stakeholder group. A similar, but more modest, example in the context of care homes comes from the Enabling Research in Care Homes (EnRICH) initiative which hosts forums where care home staff, NHS clinicians and academic researchers can meet to discuss research ideas from the early stages of development through to post-publication implementation of findings [32].

A more specific and targeted means of connecting a research group and a user group is a knowledge-broker, a person with specific responsibility to transfer or broker knowledge and information between organisations[33]. The terms “boundary spanner” and “diffusion fellow” or “clinical champion” are also often used to refer to such roles and all such terms provide a slightly different insight into the role of such a person. Clinical academics who work both as health professionals and researchers

tend to fulfil this role: as researchers they can conduct and be part of the research process and as clinicians they can be part of the implementation process of research findings. Such spanning of boundaries can be helpful in avoiding traditional paradigm clashes witnessed between researchers, impatient with health services' constant desire to innovate in an evidence vacuum and who see this as confusing the picture, and clinicians, who often feel that they cannot wait for carefully constructed empirical research to report back prior to developing services.

It will be obvious from much of the above that the methodological competencies required to be an effective implementation researcher, or implementer of research, are different from those traditionally valued and sought by medical doctors undertaking research training – with considerable emphasis still placed upon establishing expertise in trial-based methodologies driven by evidence hierarchies enshrined in the evidence-based medicine movement of the 1990s. Acknowledgement of the knowledge brokering role opens up a putative role for clinicians with competencies in both arenas, although there is no agreed core skill-set for knowledge brokers and the competencies required are likely to depend on the context in which implementation is occurring [34].

Knowledge mobilisation techniques

The academics who are the main producers of research knowledge are likely rewarded and incentivised using metrics including the number of peer reviewed publications they author, the number of research students they train, and the amount of grant income they earn and spend. They have not, conventionally, been rewarded for ensuring that their research knowledge reaches, and is used by, those who might potentially use it. It was only in 2014 that the exercise to incentivise research activity in UK universities considered “impact statements” alongside traditional markers of academic esteem. Despite this, it remains unclear the extent to which researchers should be responsible for “pushing” their research towards potential users, or the extent to which potential users should “pull” research knowledge. Academics may still feel that their time is best spent preparing for the next grant or paper. Meanwhile, few policy makers, managers, practitioners or patients have the time, opportunity or perhaps the inclination to identify or read research articles that might be relevant to their practice. Furthermore, many such articles may not be easily understood. Research articles are often written with journal reviewers and editors in mind, and are not tailored to the needs of other groups such as a UK health service commissioner, a health charity worker, or a health care professional. Researchers, with assistance from stakeholders, can prepare review, update, and position papers for professional journals or shorter evidence summaries to widen the reach of the dissemination of their findings[35]. Research findings can be disseminated using traditional broadcast and written mass media and social media. Material does not have to be solely written and reach can be achieved via smartphone apps, or using the arts such as theatre[36] or cinema[37].

Conclusions

We have proposed here that it is necessary to put the principles of CGA into practice in new settings at the same time as conducting the research into how do to so. We have argued that this means the co-production of applied health research and considerable attention to knowledge mobilisation beyond academic publication. This contrasts with the Medical Research Council framework for the development and

evaluation of complex evaluations which, although less linear in its most recent iteration, implies that the research is done first and only then it is put into practice[38]. Our arguments imply that the term “research and development” is an apt phrase to describe the process, and illustrates the overlap between clinical innovation, quality improvement, education, policy development and applied health research. This point has many implications: applied researchers need to develop skills in developing communities of interest and in knowledge mobilisation; researchers and educators need to engage with each other to develop a research-informed workforce; the funders of research and providers of services need to work together to avoid the paradoxical situation where a service needs to be implemented before it can be evaluated, yet it needs to have been evaluated before it can be implemented; and the commissioners of services and the policy makers who guide them need to know how to work with researchers so as to produce evidence-based services.

References

1 Stuck AE, Siu AL, Wieland GD, et al. Comprehensive geriatric assessment: a metaanalysis of controlled trials. *Lancet* 1993;342:1032–6.

2 Ellis G, Whitehead MA, O’Neill D, et al. Comprehensive geriatric assessment for older adults admitted to hospital. *Cochrane database Syst Rev* 2011;

3 Ellis G, Langhorne P. Comprehensive geriatric assessment for older hospital patients. *Br Med Bull* 2005;71:45–59.

4 Langhorne P. Organized Inpatient (Stroke Unit) Care for Stroke. *Stroke* 2013;45:e14–5.

5 Oliver D, Foot C, Humphries R. Making our health and care systems fit for an ageing population, available online at <http://www.lifestorynetwork.org.uk/wpcontent/uploads/downloads/2014/03/making-health-care-systems-fit-ageingpopulation-oliver-foot-humphries-mar14.pdf> (last accessed 25th November 2015).

6 Conroy S, Chikura G. Emergency care for frail older people-urgent AND important but what works? *Age Ageing* 2015;44:724–5.

7 Gordon AL, Franklin M, Bradshaw L, et al. Health status of UK care home residents: a cohort study. *Age Ageing* 2014;43:97–103.

8 Iliffe S, Davies SL, Gordon AL, et al. Provision of NHS generalist and specialist services to care homes in England: review of surveys. *Prim Health Care Res Dev* 2015;1–16.

9 Robbins I, Gordon A, Dyas J, et al. Explaining the barriers to and tensions in delivering effective healthcare in UK care homes: a qualitative study. *BMJ Open* 2013;3:

10 Goodman C, Davies SL, Gordon AL, et al. Relationships, Expertise, Incentives, and Governance: Supporting Care Home Residents’ Access to Health Care. An Interview Study From England. *J Am Med Dir Assoc* 2015 16(5):427-32

- 11 Millan M, Merino S, Caro A, et al. Treatment of colorectal cancer in the elderly. *World J Gastrointest Oncol* 2015;7:204–20.
- 12 Partridge JSL, Collingridge G, Gordon AL, et al. Where are we in perioperative medicine for older surgical patients? A UK survey of geriatric medicine delivered services in surgery. *Age Ageing* 2014;43:721–4.
- 13 Spyridonidis D, Hendy J, Barlow J. Leadership for Knowledge Translation: The Case of CLAHRCs. *Qual Health Res* 2015;25:1492–505.
- 14 Flottorp SA, Oxman AD, Krause J, et al. A checklist for identifying determinants of practice: a systematic review and synthesis of frameworks and taxonomies of factors that prevent or enable improvements in healthcare professional practice. *Implement Sci* 2013;8:35.
- 15 Cabana, M. D., Rand, C. S., Powe, N. R., Wu, A. W., Wilson, M. H., Abboud, P. A., & Rubin, H. R. (1999). Why don't physicians follow clinical practice guidelines? A framework for improvement. *JAMA*, 282(15), 1458–65.
- 16 British Geriatrics Society. Quality Care for Older People with Urgent and Emergency Care Needs (the Silver Book) available online at http://www.bgs.org.uk/campaigns/silverb/silver_book_complete.pdf (last accessed 25th November, 2015).
- 17 Royal College of Physicians. Acute Care Toolkit 3: Acute Medical Care for Frail Older People available online at <https://www.rcplondon.ac.uk/guidelinespolicy/acute-care-toolkit-3-acute-medical-care-frail-older-people> (last accessed 25th November, 2015).
- 18 BGS Commissioning Guidance - High Quality Health Care for Older Care Home Residents, available online at http://www.bgs.org.uk/campaigns/2013commissioning/Commissioning_2013.pdf (last accessed 25th November, 2015).
- 19 Grimshaw, J. M., & Russell, I. T. (1994). Achieving health gain through clinical guidelines II: Ensuring guidelines change medical practice. *Quality in Health Care* : QHC, 3(1), 45–52.
- 20 Roethler C, Adelman T, Parsons V. Assessing emergency nurses' geriatric knowledge and perceptions of their geriatric care. *J Emerg Nurs* 2011;37:132–7
- 21 Hogan TM, Losman ED, Carpenter CR, et al. Development of geriatric competencies for emergency medicine residents using an expert consensus process. *Acad Emerg Med* 2010;17:316–24.
- 22 Age UK with the British Geriatrics Society. Frailty: language and perceptions available online at http://www.ageuk.org.uk/Documents/EN-GB/Forprofessionals/Policy/healthandwellbeing/report_bgs_frailty_language_and_perceptions.pdf?dtrk=true (last accessed 26th November, 2015).

- 23 Social Care Institute of Excellence. Guide 15: Dignity in Care. Available online at: <http://www.scie.org.uk/publications/guides/guide15/> (last accessed 4th January 2016)
- 24 Gladman J, Harwood R, Conroy S, et al. Medical Crises in Older People: cohort study of older people attending acute medical units, developmental work and randomised controlled trial of a specialist geriatric medical intervention for highrisk older people; cohort study of older people with men. *Program Grants Appl Res* 2015;3.
- 25 Conroy SP, Ansari K, Williams M, et al. A controlled evaluation of comprehensive geriatric assessment in the emergency department: the 'Emergency Frailty Unit'. *Age Ageing* 2014;43:109–14.
- 26 Tinetti ME, Fried T. The end of the disease era. *Am J Med* 2004;116:179–85.
- 27 Wallis SJ, Wall J, Biram RW, Romero-Ortuno R. Association of the Clinical Frailty Scale with Hospital Outcomes. *QJM*. 2015. 108(12):943-9
- 28 Franklin M, Berdunov V, Edmans J, et al. Identifying patient-level health and social care costs for older adults discharged from acute medical units in England. *Age Ageing* 2014;43:703–7.
- 29 NHS England. Five year forward view, available online at <https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf> (last accessed 25th November 2015)
- 30 Davies SL, Goodman C, Bunn F, et al. A systematic review of integrated working between care homes and health care services. *BMC Health Serv Res* 2011;11:320.
- 31 Li LC, Grimshaw JM, Nielsen C, et al. Evolution of Wenger's concept of community of practice. *Implement Sci* 2009;4:11.
- 32 Davies, S. L., Goodman, C., Manthorpe, J., Smith, A., Carrick, N., & Iliffe, S. Enabling research in care homes: an evaluation of a national network of research ready care homes. *BMC Medical Research Methodology* 2014; 14(1), 47
- 33 Waring J, Currie G, Crompton A, et al. An exploratory study of knowledge brokering in hospital settings: facilitating knowledge sharing and learning for patient safety? *Soc Sci Med* 2013;98:79–86.
- 34 Conklin, J., Lusk, E., Harris, M., & Stolee, P. Knowledge brokers in a knowledge network: the case of Seniors Health Research Transfer Network knowledge brokers. *Implementation Science: IS* 2013; 8(1), 7.
- 35 Nottingham Derbyshire and Leicestershire Collaboration for Leadership in Applied Health Research and Care. Brokering Innovation Through Evidence (BITES) available online at <https://www.nottingham.ac.uk/clahrc-ndlnihr/publications/bites.aspx> (last accessed 26th November 2015).

36 Schneider J, Lowe S, Myers T, et al. A short report on knowledge exchange through research-based theatre: 'inside out of mind'. *Soc Sci Med* 2014;118:61–5.

37 Gladman J, Harwood R, Foster P, et al. Today is Monday – the evidence base behind a film about the care of people with dementia and delirium in hospital. *Med Cris Older People Discuss Pap Ser* 2014 available online <https://nottingham.ac.uk/mcop/documents/papers/issue13-mcop-issn2044-4230.pdf> (last accessed 25th November 2015).

38 Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ* 2008;337:a1655